

Lowell Regional Wastewater 451 First Street Boulevard Lowell, MA 01854 Attn: Aaron Fox

November 5, 2019

Dear Mr. Fox,

Enclosed please find the toxicological evaluation and chemical analyses report for the effluent sample received on October 7th, 2019. This is your fourth quarter 2019 bioassay. Please call me at (401) 353-3420 if you have any questions.

Sincerely,

Michael McCallum Technical Laboratory Director

NEW ENGLAND TESTING LABORATORY, INC.

59 Greenhill St., West Warwick, RI 02893 (401) 353-3420 TOXICOLOGICAL EVALUATION AND CHEMICAL ANALYSES OF EFFLUENT: NPDES Permit # MA0100633 Fourth Quarter 2019 Samples Lowell

> Prepared For: Lowell Regional Wastewater 451 First Street Boulevard Lowell, MA 01854

> > November 5, 2019

By New England Testing Laboratory, Inc. 59 Greenhill Street West Warwick, RI 02893

NETLAB CASE NUMBER: 9J07023



GEOTECHNICAL

ENVIRONMENTAL

ECOLOGICAL

WATER

CONSTRUCTION MANAGEMENT

77 Batson Drive Manchester, CT 06042 T: 860.643.9560 F: 860.646.7169 www.nebio.com



NEW ENGLAND BIOASSAY A DIVISION OF GZA CHRONIC AQUATIC TOXICITY TEST REPORT

Permitee:	Lov	vell RWWU			_NPDES#	MAC	0100633
Report submitted to:	New England	Testing Labo	oratori	es	_		
	59 Greenhill St	reet, West V	Varwic	k RI	- 7 -2		
Sample ID:		Effluent			_		
Test Month/Year:	Oct	tober 2019			- 5		
NEB Proj #	05.0	0044476.00			- 3:		
Test Type / Method:	Ceriodaphnia dub Test Method 100				tatic-Ren	ewal	Freshwater
Effluent Sample Dates:	#110/6-7/1	9#2	10/	8-9/1	9#3_	10	0/10-11/19
Test Start	Date:	10/	8/19				
	Re	esults Summ	ary				
Your results were as foll Passed all permit limits	ows:						
		ute Test Res					
Species	LC50	A-NOE			mit Limit	F	Pass / Fail
Ceriodaphnia dubia	>100%	100%		≥	100%	Pass	
	Chro	onic Test Res	sults				
Species	C-NOEC	C-LOEC	IC	25	Permit L	imit	Pass/Fail
Ceriodaphnia dubia	6.25%	12.5%	26.	5%	N/A		N/A
Data Qualifiers affecting	this test:				.*		1
v v					ŧ		

Certifications & Approvals: NH ELAP (2071), NJ DEP (CT405)

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Test Report Certification

Permittee name:	Lowell RWWU	Permit number:	MA0100633	
Client sample ID:	Effluent	Test Start Date:	10/8/19	

Whole Effluent Toxicity Test Report Certification (Permittee)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on:	
(Date)	Authorized Signature
	Print or Type Name and Title
	Print or Type the Permittee's Name
	MA0100633
	Print or Type the NPDES Permit Number

Whole Effluent Toxicity Test Report Certification (Bioassay Laboratory)

The results reported relate only to the samples submitted as received

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on:

Kimberly Wills

Laboratory Manager

New England Bioassay a division of GZA

General Test Conditions

Permittee name	Lowell RWWU	Permi	t number: _	MA0100633
Sample Collect Effluent #1 Dates/Times: 10/6-7/19 @ 0700-0700 Effluent #2 Dates/Times: 10/8-9/19 @ 0700-0700 Effluent #3 Dates/Times: 10/10-11/19 @ 0700-0700 Were a minimum of three samples collected? Yes were samples used within the first 36 hours of collection* sample collection note: Test Co Permittee's Receiving Water: Merrimack River Dilution water: Laboratory synthetic soft water (hard Control water: Receiving water collected at a point im Effluent concentrations tested: 0%, 6.25%, 12.5%, 25% Was effluent salinity adjusted? No Yes were was elevated due to interference. Chlorine was elevated due to interference. Chlorine was elevated due to interference.	Test S	tart Date: _	10/8/19	
	Sample Collection	on Information		
Effluent #2 Dates/Times: 10 Effluent #3 Dates/Times: 10 Were a minimum of three sa	0/8-9/19 @ 0700-0700 1/10-11/19 @ 0700-0700 1mples collected? Yes	No □*(see note	Date/Time: _1 Date/Time: _1	0/9/19 @ 0800 0/11/19 @ 0748
	Test Con	ditions		
Dilution water: Laborator Control water: Receiving water: Receiving water: Receiving water Effluent concentrations tester Was effluent salinity adjuster Dechlorination procedures: Concentration procedures:	y synthetic soft water (hardnater collected at a point immed: 0%, 6.25%, 12.5%, 25%, d? No Yes with the chlorine is measured using 45 to interference. Chlorine was	nediately upstream of 50%, 100% The Instant Ocean seas 500 CL-G DPD Colorin as ≤ 0.05 mg/L by am	f or away fron salts to netric Method perometric tit	ppt I ration
	Reference To	xicant Data		X X E
	Ceriodaphi	nia dubia		
	Date:	10/1/19		
	Toxicant:	Sodium chloride		
	Dilution Water:	NEB CTRMH		
	Organism Source:	NEB		
	Reproduction IC25:	1.02 g/L		
	Results within range	Yes 🗹 No 🗀		

		Cer	iodaphnia du	<i>bia</i> Test I	Results	
Permittee nam	e:	Lowe	ll RWWU		Permit number:	MA0100633
Client sample I	D:	Effluent		Test Dates:	10/8/19	- 10/15/19
		Te	st Acceptability C	riteria		
Lab Diluent Surv	ival:	80% Mea	an Lab Diluent Repi	roduction:		ing per female
River Control Sur	rvival:	90% Mea	an River Control Re	production:	22.7you	ing per female
Thiosulfate Cont	rol Survival	I: <u>N/A</u> % Mea	an Thiosulfate Cont	rol Reproduct	tion: <u>N/A</u> you	ing per female
		ndicates EPA criteri	a was not met, see	explanation in	n the "Results Disc	cussion" section at
the bottom of th	e following	g page.				
			Test Results			
-			Permit Limit	Test Result	Pass/Fail Status	
	Acuto	48 hr LC50	≥ 100%	>100%	Pass	
	Acute Data	48 hr NOEC		100%		
	Duta	TUa			Kara Light Cold	
		Chronic LC50	2000	>100%		

	TUa	A TOTAL TOTAL		
	Chronic LC50	3465	>100%	
	Survival C-NOEC		100%	
	Survival C-LOEC		>100%	
	Reproduction C-NOEC		6.25%	
Chuauia	Reproduction C-LOEC		12.5%	
Chronic Data	Reproduction IC25		26.5%	
Julia	Reproduction IC50		56.8%	
	Reportable C-NOEC		6.25%	
	Reportable C-LOEC		12.5%	
	MATC		8.8%	
			A STATE OF THE PARTY OF THE PAR	

Presence of an asterisk (*) indicates qualified data, see explanation in the "Results Discussion" section at the bottom of the following page.

TUc

Test Variability	
Reproduction PMSD:17.5% Upper & Lower EPA bounds: 13 - 47% 🗌 Low 🗹 Within bounds 🔲 High	
PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine	
the presence of toxicity at the permit limit concentration (PLC)	
$ ilde{ullet}$ The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.	
\square PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent	
difference (RPD) between the control and each treatment was calculated and compared to the lower bound.	
The RPD values for all concentrations fall below the lower bound. Any differences observed in this test are considered statistically insignificant.	
Some of the concentrations that were flagged as statistically significant have RPD values that fall below the lower bound. Any differences observed in these concentrations will not be considered statistically significantly decreased from the control.	
\square No statistically significant reductions were observed in this test.	

Ceriodaphnia dubia Test Results

Permittee name:	Lowell RWWU	Permit number: MA0100633	_
Client sample ID:	Effluent	Test Dates:10/8/1910/15/19	
	Consentration Down	First Control	_
	Concentration - Respo	onse Evaluation	
=	nificant effects at any test concentra entrations performed very similarly to	ation with a flat concentration-response curve. o dilution control.	
following i Effluent To	tem number in Chapter Four of "Me	bserved in this data set corresponds to the thod Guidance and Recommendations for Whole 6)", EPA 821-B-00-004, July 2000: #1 Ideal	
The concentration - respo	nse relationship was reviewed and t	he following determination was made:	
Survival Reproduct	ion		
xx	Results are reliable and report	able	
	Results are anomalous (see	explanation below)	
	Results are inconclusive - rete	st (see explanation below)	
	Results Discussion (if applicable):	

TEST METHODS

Ceriodaphnia dubia

Test type: Modified Chronic Static Renewal Freshwater Test

Test Reference Manual: EPA-821-R-02-013 "Short-Term Methods for Estimating the Chronic Toxicity of

Effluents and Receiving Water to Freshwater Organisms"

Test Method: Ceriodaphnia dubia Survival and Reproduction Test - EPA 1002.0

Temperature: 25 °C \pm 1°C (Temperatures should not deviate by more than 3°C during the test)

(required)

Light Quality: Ambient Laboratory Illumination (recommended)

Light Intensity: 10-20 μE/m2/s, or 50-100 ft-c (recommended)

Photoperiod: 16 hours light, 8 hours dark (recommended)

Test chamber size: 30 mL (recommended minimum)

Test solution volume: 15 mL (recommended minimum)

Renewal of Test Solutions: Daily (required)

Age of Test Organisms: Less than 24 hours; and all released within a 8-h period (required)

Number of Neonates

Per Test Chamber: 1 Assigned using blocking by known parentage (required)

Number of Replicate Test

Chambers Per Treatment: 10 (required minimum)

Number of Neonates Per

Test Concentration: 10 (required minimum)

Feeding Regime: Fed 0.1 mL each of YCT and algal suspension per exposure chamber daily.

(recommended)

Cleaning: Use new plastic cups daily (recommended)

Aeration: None (recommended)

Test Duration: Until 60% or more of control females have three broods

(maximum test duration 8 days) (required)

Endpoints: Survival and reproduction (required)

Test Acceptability: 80% or greater survival of all control organisms and an average of 15 or more

young per surviving female in the control solutions. 60% of surviving control

females must produce three broods. (required)

Sampling Requirements: Minimum of three samples with a maximum holding time of 36 hours before

first use. (required)

Sample volume required: 1 L/Day (recommended)

CERIODAPHNIA DUBIA DATASHEETS & STATISTICAL ANALYSIS

NEW ENGLAND BIOASSAY TOXICITY DATA FORM CHRONIC COVER SHEET

	CHK	ONIC COVER SHI	EE 1		
CLIENT: N	lew England Testing Labora	atories	C.dubia TEST	ID#_	19-1448
ADDRESS:	59 Greenhill Street		CHAIN OF CUSTOE	-	C39-3714/15
-	West Warwick, RI 0289	93	NEB PROJEC	_	05.0044476.00
PERMITTEE:	Lowell RWWU		SAMPLE	-	Effluent
PERMIT NUMBER:	MA0100633			_	
DILUTION WATER:	Laboratory Soft Wate	r			
		INVERTEBRATES			
TEST SET	T-UP TECHNICIAN:	CW			
	TEST SPECIES: Ce	riodaphnia dubia			
		Cd19(RMH 223)			
	AGE:	< 24 hours			
TEST SOLUTIO	N VOLUME (mls):	15			
ORGANISMS PER	R TEST CHAMBER:	1			
ORGANISMS PER C	CONCENTRATION:	10			
	LABORATO	DRY CONTROL WATE	R (SRCF)		
	Lot Number	Hardness mg/L CaCO ₃	Alkalinity mg/L CaCO ₃		
	C39-S024	48	30		
		DATE	TINAS		
	†	DATE	TIME		
	TEST START:	10/8/19	1355		
	TEST END:	10/15/19	1448		
	•				
COMMENTS:					
8 					
*			· · · · · · · · · · · · · · · · · · ·		1 1
REVIEWED BY:		1/1	DATE:		11/4/19

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & AD	DRESS: Lowel	l Regiona	l WW Utili	ty, 1st Street Bo	ulevard, Lowell MA	01850	
NEB PROJECT NUMBE	R; 05.004	4476.00	NEB T	EST NUMBER:	19-1448	COC#	C39-3714/15
TEST ORGANISM:	Ceriodaphnia du	bia	AGE:	<24 hours		Lot #	Cd19(RMH 223)
START DATE:	10/8/19	TIME:	1355	END DATE:	10/15/19	TIME:	1448

	57		Cultur	e Lot#			Cd19(F	RMH 22	23)			ľ			
	Cup#	A2	А3	A4	A5	A6	A7	A8	A9	A10	A11	Total	# Live	Analyst-	Analyst-
Effluent	Day					Rep	licate					Live Young	Adults	Transfer	Counts
Concentration	Number	Α	В	С	D	E	F	G	Н	ĩ	J				
	0	√	✓	1	✓	✓	✓	✓	✓	✓	√	0	10	CW	M.
	1	>	√	✓	1	✓	✓	✓	✓	✓	✓	0	10	PD	
	2	√	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	СН	
NEB Lab	3	5	✓	✓	1	✓	✓	✓	✓	4	✓	9	10	PD	PD
Synthetic	4	1	6	5	5	5	5	6	4	5	3	45	10	PD	PD
Diluent	5	7	7	8	7	9	9	10	5	5	6	73	10	ко	ко
	6	9	9	8	7	8	10	✓	3/x	✓	✓	54	9	СН	СН
	7	√/x	6	✓	✓	✓	1	10	Х	9	11	36	8	PD	PD
	totals	22	28	21	19	22	24	26	12	23	20	217	8	5	MC
		Α	В	С	D	E	F	G	Н	1	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	√	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
Merrimack	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
River	4	6	6	6	4	6	5	7	6	5	5	56	10	18	
Control	5	6	9	8	7	8	7	10	10	7	1/x	73	9	L L COS	
	6	9	11	9	✓	✓	✓	✓	✓	✓	Х	29	9		Topics
	7	✓ .	✓	✓	10	13	12	14	8	12	Х	69	9		8/8/7
	totals	21	26	23	21	27	24	31	24	24	6	227	9		
		Α	В	С	D	E	F	G	Н		J				
	0	√	√	✓	_ <	✓	_ ✓	✓	√	✓	√	0	10		
	1	✓	✓	✓	✓	√	√	✓	✓	✓	√	0	10		
	2	√	✓	√	✓	√	✓	√	√	✓	√	0	10		
8	3	√	√		_ ✓	√	_ ✓	✓	√	✓	√	0	10	0.00	
6.25%	4	4	4	1	5	6	5	6	6	5	5	47	10		
	5	9	10	7	8	6	6	11	8	8	6	79	10	31.3	
	6	2	7	9	11	8	✓	✓	9	8	10	64	10	TO BUILD	100
	7	✓	✓	8	✓	✓	10	12	✓	√	✓	30	10		
Į	totals	15	21	25	24	20	21	29	23	21	21	220	10	e in	

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NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS: Lowell Regional WW Utility, 1st Street Boulevard, Lowell MA 01850

NEB PROJECT NUMBER: 05.0044476.00 ORGANISM: Ceriodaphnia dubia START DATE: 10/8/19

						Por	olicate					Total Live	# Live		
Effluent	Day	A	В	С	D	E	F	G	Н	1	J	Young	Adults		
Concentration	Number 0	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	→	\ \ \	\ \ \	\ \	\ \ \	\ \		1	1	0	10		
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	2	√	V	√	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\ \	√	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	0	10		
	3	\	V	√	V	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	V	√	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<i>\</i>	V	0	10		
	4	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	5	4	4	5	5	6	4	6	2	41	10		
12.5%	5	8	5	8	6	2	8	6	2	3	3	51	10		
	6	9	7	9	4	9	1	1	11	8	7	65	10		
	7	1	1	√	1	√	√/x	11	√/x	2	1	13	8	DILL SVI. TO	100
									,					1200	
	totals	17	17	21	14	16	14	23	17	19	12	170	8	Alabah	
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	0	√	√	√	√	√	V	√	√	1	√	0	10	i de la	
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	2	√	√	√	✓	√	√	√	✓	√	✓	0	10	HI WIR	Pan F
	3	√	√	√	√	✓	√	√	√	√	√	0	10	nx doi	
25%	4	5	3	4	4	3	5	6	5	6	4	45	10		
	5	✓	4	4	9	5	6	6	7	3	6	50	10		
	6	5	✓	✓	6	9	✓	✓	✓	8	1	29	10	7.0	items
	7	✓	8	6	✓	√	9	4	7	✓	9	43	10	ART	
														集色道	
	totals	10	15	14	19	17	20	16	19	17	20	167	10	SV OT LE	
		Α	В	С	D	Е	F	G	H	L	J				
	0	✓	✓	✓	✓	✓	✓	✓	√	✓	✓	0	10		11-3-1
	1	✓	✓	_✓	✓	✓	✓	✓	✓	✓	✓	0	10		DAIL B
	2	✓	✓	✓	✓	✓	✓		✓	✓	✓	0	10		
	3	✓	✓	✓	✓	✓	✓	√	✓	✓	✓	0	10		
50%	4	4	4	3	5	5	5	\checkmark	4	4	4	38	10		55000
	5	4	3	4	2	4	6		6	3	5	37	10	10.00	
	6	√	√	✓	5	√	√	√	√	√	1	6	10		
	7	4/x	6	✓	√	6/x	8	√	3	4	4	35	8		
		- 40	- 40		- 10										
	totals	12	13	7	12	15	19	0	13	11	14	116	8		
		A	В	C	D	E	F	G	Н	1	J	it wa'l			16 50
	0	√	√	√	√	√	√	√	√	√	√	0	10		
1	1	√	√	√	√	√	√	√	√	√	√	0	10	Me day	
	2	√	√	√	√	√	√	√	√ /	√	√	0	10		
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100%	4	4	6	5	6	5	6	4	5	✓ 	6	47	10		
	5	1	2	√ /	2	√ /	√ //×	√ //v	3	4	√	12	10		
	6 7	√ 2	✓ ✓	1	√ 2	√ 2	√/x	√/x ∨	✓ ✓	√	√ /	0	8		
		2	-	1	2	2	Х	Х		√		7	8		
	totals	7	8	6	10	7	6	4	8	4	6	66	8		
L	totals		٥	0	10	/	0	4	0	4	O	00	0	S	17 I HO

Report Date: Test Code/ID: 16 Oct-19 11:38 (p 1 of 6) 19-1448 / 05-5255-8871

										Test Code/I	D:	19-1448 / (05-5255-887°
Ceriod	aphnia 7-	d Survival an	d Reprodu	ction T	est							New Englar	nd Bioassay
Analys	is ID: 12	2-5620-5986	End	point:	2d \$	Survival Rat	е			CETIS Vers	ion: CETI	Sv1.9.4	
Analyz	ed: 16	6 Oct-19 11:37	Ana	lysis:	Line	ear Interpola	ition (ICPIN	l)		Status Leve	el: 1		
Batch	ID: 00	0-2573-6666	Test	t Type:	Reg	roduction-S	urvival (7d)		Analyst:			
Start D	ate: 08	8 Oct-19 13:55		tocol:		V821/R-02-	•			Diluent:	Laboratory \	Vater	
Ending	Date: 1	5 Oct-19 14:48	Spe	cies:	Cer	iodaphnia d	ubia			Brine:	Not Applicat	ole	
Test Le	ength: 70	d 1h	Tax	on:	Bra	nchiopoda				Source:	In-House Co	ılture	Age: <24
Sample	e ID: 20	0-3790-6911	Cod	e:	797	7FDDF				Project:			
Sample	e Date: 07	7 Oct-19 07:00	Mate	erial:	WW	/TF Effluent	t			Source:	Lowell RWV	VU (MA01006	33)
Receip	t Date: 08	3 Oct-19 08:20	CAS	(PC):						Station:			
Sample	e Age: 31	1h	Clie	nt:	Nev	v England T	esting Labs	\$					
Linear	Interpola	tion Options											
X Trans	sform	Y Transform	See	d	Res	amples	Exp 95%	CL Met	hod				
Log(X)		Linear	1416	6448	200		Yes	Two	-Point I	nterpolation			
Point E	Stimates												
Level	%	95% LCL	95% UCL	TU		95% LCL	95% UCL						
LC50	>100	n/a	n/a	<1		n/a	n/a						
2d Sur	vival Rate	Summary					Calcu	ulated Varia	ate(A/B)			Isoto	nic Variate
Conc-%	6	Code	Count	Mean		Min	Max	Std Dev	CV%	%Eff€	ect A/B	Mean	%Effect
0		D	10	1.000	0	1.0000	1.0000	0.0000	0.009	% 0.0%	10/10	1	0.0%
6.25			10	1.000	0	1.0000	1.0000	0.0000	0.009	% 0.0%	10/10	1	0.0%
12.5			10	1.000	0	1.0000	1.0000	0.0000	0.009	% 0.0%	10/10	1	0.0%
25			10	1.000	0	1.0000	1.0000	0.0000	0.009	% 0.0%	10/10	1	0.0%
50			10	1.000	0	1.0000	1.0000	0.0000	0.009	% 0.0%	10/10	1	0.0%
100			10	1.000	0	1.0000	1.0000	0.0000	0.009	% 0.0%	10/10	1	0.0%
2d Sun	vival Rate	Detail											
Conc-%	6	Code	Rep 1	Rep 2	!	Rep 3	Rep 4	Rep 5	Rep	6 Rep 7	Rep 8	Rep 9	Rep 10
0		D	1.0000	1.000	0	1.0000	1.0000	1.0000	1.000	1.000	0 1.0000	1.0000	1.0000
6.25			1.0000	1.000	0	1.0000	1.0000	1.0000	1.000	00 1.000	0 1.0000	1.0000	1.0000
12.5			1.0000	1.000	0	1.0000	1.0000	1.0000	1.000	00 1.000	0 1.0000	1.0000	1.0000
25			1.0000	1.000	0	1.0000	1.0000	1.0000	1.000	00 1.000	0 1.0000	1.0000	1.0000
50			1.0000	1.000	0	1.0000	1.0000	1.0000	1.000	00 1.000	0 1.0000	1.0000	1.0000
100			1.0000	1.000	0	1.0000	1.0000	1.0000	1.000	00 1.000	0 1.0000	1.0000	1.0000
2d Sur	vival Rate	Binomials											
Conc-%	6	Code	Rep 1	Rep 2	}	Rep 3	Rep 4	Rep 5	Rep	6 Rep 7	Rep 8	Rep 9	Rep 10
0		D	0/1	1/1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25			1/1	1/1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5			1/1	1/1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25			1/1	1/1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50			0/1	1/1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100			1/1	1/1		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
			77.1	17.1		., .	17.1	17.1	17.1	17.1	17.1	17.1	17.1

000-222-335-4

CETIS™ v1.9.4.1

Analyst:___ QA:_

Report Date: Test Code/ID: 16 Oct-19 11:38 (p 2 of 6) 19-1448 / 05-5255-8871

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analyzed:

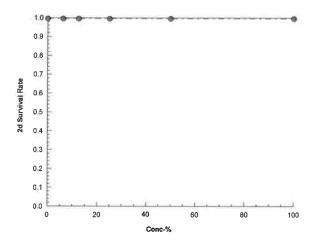
Analysis ID: 12-5620-5986 16 Oct-19 11:37 **Endpoint:** 2d Survival Rate Analysis:

Linear Interpolation (ICPIN)

CETIS Version: Status Level:

CETISv1.9.4

Graphics



Analyst:__ QA:

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Report Date:

16 Oct-19 11:38 (p 3 of 6)

OLIIO	Alla	iyticai itepo	/1 C						Test C	ode/ID:		19-1448 / 0)5-5255-887
Cerioda	phnia	7-d Survival and	d Reproduc	ction Te	est							New Englan	d Bioassa
Analysis		03-2907-0606			7d Survival F				CETIS	Version		v1.9.4	
Analyzed	d:	16 Oct-19 11:37	Ana	lysis:	Linear Interp	olation (ICPII	۷)		Status	s Level:	1		
Batch ID) :	00-2573-6666	Test	t Type:	Reproduction	n-Survival (7d)		Analys	st:			
Start Dat	te:	08 Oct-19 13:55	Prof	tocol:	EPA/821/R-0	02-013 (2002)	1		Diluer	nt: Lal	oratory W	ater	
Ending [Date:	15 Oct-19 14:48	Spe	cies:	Ceriodaphnia	a dubia			Brine:	: No	t Applicable	е	
Test Len	ngth:	7d 1h	Taxe	on:	Branchiopod	а			Sourc	e: In-	House Cult	ure	Age: <2
Sample I	ID:	20-3790-6911	Cod	le:	7977FDDF				Projec	et:			
Sample I	Date:	07 Oct-19 07:00	Mate	erial:	WWTF Efflu	ent			Sourc	e: Lov	well RWWl	J (MA010063	33)
Receipt I	Date:	08 Oct-19 08:20	CAS	(PC):					Statio	n:			
Sample /	Age:	31h	Clie	nt:	New England	d Testing Lab	s						
_inear In	nterpo	lation Options											
X Transf	form	Y Transform			Resamples	Exp 95%		ethod					
Log(X)		Linear	4476	376	200	Yes	Tv	vo-Point	Interpol	lation			
Гest Асс	eptab	ility Criteria	TAC L	imits									
Attribute)	Test Stat	Lower	Uppe	r Overlaj	Decision	1						
Control R	Resp	0.8	0.8	>>	Yes	Passes (Criteria						
Point Es	timate	es											
	%	95% LCL	95% UCL		95% LC								
_C50	>100	n/a	n/a	<1	n/a	n/a							
7d Survi	val Ra	te Summary				Calc	ulated Va	riate(A/E	3)			Isotor	nic Variate
Conc-%		Code	Count	Mean		Max	Std De			%Effect	A/B	Mean	%Effect
)		D	10	0.800		1.0000	0.4216	52.7		0.0%	8/10	0.9	0.0%
5.25			10	1.000		1.0000	0.0000	0.00		-25.0%	10/10	0.9	0.0%
2.5			10	0.800		1.0000	0.4216	52.7		0.0%	8/10	0.9	0.0%
25			10	1.000		1.0000	0.0000	0.00		-25.0%	10/10	0.9	0.0%
50			10	0.800		1.0000	0.4216	52.7		0.0%	8/10	8.0	11.11%
100			10	0.800	0.0000	1.0000	0.4216	52.7	0%	0.0%	8/10	0.8	11.11%
d Survi	val Ra	ite Detail											
Conc-%		Code	Rep 1	Rep 2		Rep 4	Rep 5	Rep		Rep 7	Rep 8	Rep 9	Rep 10
)		D	0.0000	1.000		1.0000	1.0000	1.00		1.0000	0.0000	1.0000	1.0000
5.25			1.0000	1.000		1.0000	1.0000	1.00		1.0000	1,0000	1.0000	1.0000
12.5			1.0000	1.000		1.0000	1.0000	0.00		1.0000	0.0000	1.0000	1.0000
25			1.0000	1.000		1.0000	1.0000	1.00		1.0000	1.0000	1.0000	1.0000
50			0.0000	1.000		1,0000	0.0000	1.00		1.0000	1.0000	1,0000	1.0000
100			1.0000	1,000	0 1,,0000	1,0000	1.0000	0.00	00	0.0000	1.0000	1,0000	1.0000
d Survi	val Ra	te Binomials											
Conc-%		Code	Rep 1	Rep 2		Rep 4	Rep 5	Rep		Rep 7	Rep 8	Rep 9	Rep 10
)		D	0/1	1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1	1/1
5.25			1/1	1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1	1/1
12.5			1/1	1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1	1/1
25			1/1	1/1	1/1	1/1	1/1	1/1		1/1	1/1	1/1	1/1

000-222-335-4 CETIS™ v1.9.4.1 Analyst:_____ QA:____

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Report Date: Test Code/ID: 16 Oct-19 11:38 (p 4 of 6) 19-1448 / 05-5255-8871

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

Analyzed:

Analysis ID: 03-2907-0606 16 Oct-19 11:37 Endpoint: 7d Survival Rate Analysis:

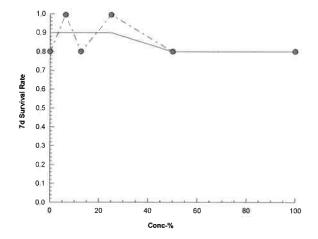
Linear Interpolation (ICPIN)

CETIS Version: Status Level:

CETISv1.9.4

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Graphics



Report Date: Test Code/ID: 16 Oct-19 11:38 (p 5 of 6) 19-1448 / 05-5255-8871

										Test	Code/ID:			19-1448 /	05-5255-88
Cerio	daphnia	7-d Survival an	d Reprodu	ction T	est								ı	New Engla	nd Bioassa
Analys	sis ID:	17-3205-4808	End	point:	Reprodu	uction				CET	IS Versio	n: (CETISV	1.9.4	
Analya	zed:	16 Oct-19 11:38	Ana	lysis:	Linear Ir	nterpola	ition (ICPIN	l)		State	us Level:	•	1		
Batch	ID:	00-2573-6666	Tes	t Type:	Reprodu	uction-S	urvival (7d))		Anal	yst:				
Start [Date:	08 Oct-19 13:55	Pro	tocol:	EPA/82	1/R-02-	013 (2002)			Dilu	ent: La	aborat	tory Wa	iter	
Endin	g Date:	15 Oct-19 14:48	Spe	cies:	Cerioda	phnia d	ubia			Brin	e: N	ot Apı	plicable		
Test L	ength:	7d 1h	Tax	on:	Branchio	opoda				Soul	rce: In	-Hous	se Cultu	ıre	Age: <2
Sampl	le ID:	20-3790-6911	Cod	le:	7977FD	DF				Proje	ect:				
Sampl	le Date:	07 Oct-19 07:00	Mat	erial:	WWTF	Effluent	:			Soul	rce: Lo	well l	RWWU	(MA01006	33)
Recei	ot Date:	08 Oct-19 08:20	CAS	(PC):						Stati	on:				
Sampl	le Age:	31h	Clie	nt:	New Eng	gland T	esting Labs	5							
Linear	Interpo	olation Options													
X Tran	sform	Y Transform	n See	d	Resamp	oles	Exp 95%	CL I	Method						
Linear		Linear	966	482	200		Yes		Two-Point	Interp	olation				
Test A	cceptal	bility Criteria	TAC L	imite											
Attribu	ıte	Test Stat		Uppe	r Ov	erlap	Decision								
Contro	Resp	21.7	15	>>	Yes	<u> </u>	Passes C	riteria							
Point I	Estimat	es													
Level	%	95% LCL	95% UCL	TU	959	% LCL	95% UCL								
IC25	26.53	3 11.13	34.81	3.769	2.8	73	8.984								
IC50	56.75	5 40.83	72.47	1.762	1.3	8	2.449								
Repro	duction	Summary					Ca	lculated	d Variate					isoto	nic Variate
Conc-	%	Code	Count	Mean	Mir	1	Max	Std D	ev CV	%	%Effect			Mean	%Effec
0		D	10	21.7	12		28	4.347	20.	03%	0.0%			21.85	0.0%
6.25			10	22	15		29	3.651	16.	60%	-1.38%			21.85	0.0%
12.5			10	17	12		23	3.333	19.	61%	21.66%			17	22.2%
25			10	16.7	10		20	3.129	18.	73%	23.04%			16.7	23.57%
50			10	11.6	0		19	5.082	43.	B1%	46.54%			11.6	46.91%
100			10	6.6	4		10	1.838	27,	85%	69.59%			6.6	69.79%
Repro	duction	Detail													
Conc-	%	Code	Rep 1	Rep 2	Rej	р 3	Rep 4	Rep 5	i Re _l	6	Rep 7	R	ep 8	Rep 9	Rep 10
0		D	22	28	21		19	22	24		26	12	2	23	20
6.25			15	21	25		24	20	21		29	23	3	21	21
12.5			17	17	21		14	16	14		23	17	7	19	12

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CETIS™ v1.9.4.1

Analyst:_____ QA:____

Report Date: Test Code/ID: 16 Oct-19 11:38 (p 6 of 6) 19-1448 / 05-5255-8871

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

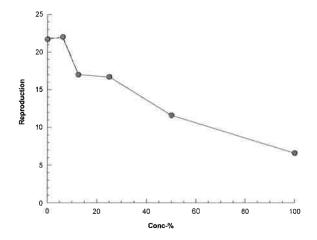
Analysis ID: 17-3205-4808 **Analyzed:** 16 Oct-19 11:38

Endpoint: Reproduction
Analysis: Linear Interpolation (ICPIN)

CETIS Version: Status Level:

on: CETISv1.9.4 1

Graphics



Report Date:

16 Oct-19 11:38 (p 1 of 2)

CETIS Analy	rucai Kepo	ort					-	Code/ID		19-1448 / ()5-5255-88
Ceriodaphnia 7-	-d Survival an	d Reprod	uction Test							New Englar	
Analysis ID: 20	0-4140-6329	Er	ndpoint: 7d	Survival Ra	te		CET	S Versio	n: CETIS	1.9.4	
Analyzed: 16	6 Oct-19 11:37	Ar	n alysis: ST	P 2xK Conti	ingency Tab	les	Statu	ıs Level	: 1		
Batch ID: 00	0-2573-6666	Te	st Type: Re	production-	Survival (7d)		Anal	yst:			
Start Date: 08	8 Oct-19 13:55			A/821/R-02			Dilue	-	aboratory Wa	ater	
Ending Date: 15	5 Oct-19 14:48	Sp	ecies: Ce	riodaphnia d	dubia		Brine		ot Applicable		
Test Length: 70	d 1h	Та	ixon: Bra	anchiopoda			Sour	ce: I	n-House Culti	ıre	Age: <2
•	0-3790-6911		ode: 79	77FDDF			Proje	ect:			
Sample Date: 07	7 Oct-19 07:00	Ma	aterial: W\	NTF Effluen	rt		Sour	ce: L	owell RWWU	(MA01006	33)
Receipt Date: 08	8 Oct-19 08:20	CA	AS (PC):				Stati	on:			
Sample Age: 31	1h	CI	ient: Ne	w England 1	Testing Labs						
Data Transform		Alt Hyp					NOEL	LOEL	TOEL	TU	
Untransformed		C > T					100	>100	n/a	1	
Fisher Exact/Bo	nferroni-Holm	n Test									
Control vs	Group		Test Stat	P-Type	P-Value	Decision	(a:5%)				
Dilution Water	6.25		1.0000	Exact	1.0000	Non-Sign	ificant Effect				
	12.5		0.7090	Exact	1.0000	Non-Sign	ificant Effect				
	25		1.0000	Exact	1,0000	Non-Sign	ificant Effect				
	50		0.7090	Exact	1.0000	Non-Sign	ificant Effect				
	100		0,7090	Exact	1.0000	Non-Sign	ificant Effect				
Test Acceptabili	ity Criteria	TAC	Limits								
Attribute	Test Stat	Lower	Upper	Overlap	Decision						
Control Resp	0.8	0.8	>>	Yes	Passes C	riteria					
Data Summary											
Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect				
0	D	8	2	10	8.0	0.2	0.0%				
6.25		10	0	10	1	0	-25.0%				
12.5		8	2	10	0.8	0.2	0.0%				
25		10	0	10	1	0	-25.0%				
50		8	2	10	0.8	0.2	0.0%				
100		8	2	10	0.8	0.2	0.0%				
7d Survival Rate	e Detail										
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12,5		1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		0.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1,0000	0.0000	0.0000		1.0000	1.0000
7d Survival Rate	Binomials										

Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
D	0/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1	1/1
	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	1/1	1/1	1/1	1/1	1/1	0/1	1/1	0/1	1/1	1/1
	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	0/1	1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1
	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1	1/1	1/1
		D 0/1 1/1 1/1 1/1 1/1 0/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1	D 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 0/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 1

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CETIS™ v1.9.4.1

Analyst:___ QA:_

Report Date: Test Code/ID: 16 Oct-19 11:38 (p 2 of 2) 19-1448 / 05-5255-8871

Ceriodaphnia 7-d Survival and Reproduction Test

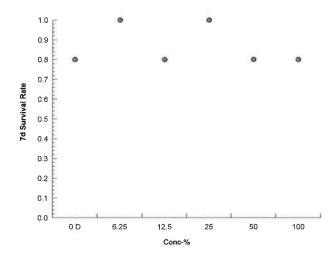
New England Bioassay

Endpoint: 7d Survival Rate **Analysis ID:** 20-4140-6329 16 Oct-19 11:37

CETIS Version:

CETISv1.9.4 Status Level: 1

Analyzed: Graphics



Analysis:

STP 2xK Contingency Tables

Report Date: Test Code/ID: 16 Oct-19 11:38 (p 1 of 2) 19-1448 / 05-5255-8871

Ceriodaphnia 7-	d Survival an	d Reprod	duction Tes	t					N	lew Englan	d Bioassa
Analysis ID: 08	3-4538-9939	E	ndpoint: R	eproduction			CET	IS Version	: CETISv	1.9.4	
Analyzed: 16	6 Oct-19 11:38	3 A	nalysis: P	arametric-Co	ntrol vs Trea	tments		us Level:	1		
Batch ID: 00	0-2573-6666	T	est Type: R	eproduction-S	Survival (7d)		Anal	vst:			
	3 Oct-19 13:55			PA/821/R-02-	, ,		Dilu	-	boratory Wa	ter	
Ending Date: 15	5 Oct-19 14:48	s s	pecies: C	eriodaphnia d	lubia		Brin		t Applicable		
Test Length: 70	d 1h		•	ranchiopoda			Soul		House Cultu	re	Age: <2
Sample ID: 20	0-3790-6911	С	ode: 7	977FDDF			Proje	ect:			
Sample Date: 07				/WTF Effluen	t		Soul		well RWWU	(MA010063	33)
Receipt Date: 08			AS (PC):		•		Stati			(,,
Sample Age: 31	lh			ew England T	esting Labs		0141	····			
Data Transform		Alt Hyp)				NOEL	LOEL	TOEL	TU	PMSD
Untransformed		C > T					6.25	12.5	8.839	16	17.48%
Dunnett Multiple	Comparisor	Test									
Control vs	Conc-%		Test Sta	nt Critical	MSD DF	P-Type	P-Value	Decision	n(a:5%)		
Dilution Water	6.25		-0.1811	2.289	3.792 18		0.8816		nificant Effec	t	
	12.5*		2,837	2.289	3.792 18		0.0135	Significa		•	
	25*		3.018	2.289	3.792 18		0.0084	Significa			
	50*		6.097	2.289	3.792 18	CDF	1.2E-06	Significa			
	100*		9.115	2.289	3.792 18	CDF	9.4E-07	Significa	nt Effect		
Test Acceptabili	ty Criteria	TAC	Limits								
Attribute	Test Stat		Upper	Overlap	Decision						
Control Resp	21.7	15	>>	Yes	Passes Ci	riteria					
PMSD	0.1748	0.13	0.47	Yes	Passes Ci	riteria					
ANOVA Table											
Source	Sum Squa	ares	Mean So	quare	DF	F Stat	P-Value	Decision	n(α:5%)		
Between	1776.73		355.347		5	25.9	<1.0E-37	Significa	nt Effect		
Error	741		13.7222		54						
Total	2517.73				59	_					
Distributional Te	sts										
Attribute	Test				Test Stat	Critical	P-Value	Decision	ı(a:1%)		
√ariances	Bartlett Eq	uality of \	/ariance Tes	t	8.86	15.09	0.1148	Equal Va	riances		
Distribution	Shapiro-W	ilk W Nor	mality Test		0.9484	0.9459	0.0131	Normal D	Distribution		
Reproduction Su	ımmary										
	Code	Count	Mean	95% LCL		Median	Min	Max	Std Err	CV%	%Effect
Conc-%	Code	10	21.7	18.59	24.81	22	12	Max 28	Std Err 1,375	CV% 20.03%	%Effect 0.00%
) 3.25		10 10	21.7 22	18.59 19.39	24.81 24.61	22 21	12 15	28 29	1,375 1.155		
) 5.25 12.5		10 10 10	21.7 22 17	18.59 19.39 14.62	24.81 24.61 19.38	22 21 17	12 15 12	28 29 23	1.375 1.155 1.054	20.03% 16.60% 19.61%	0.00% -1.38% 21.66%
0 3.25 12.5 25		10 10 10 10	21.7 22 17 16.7	18.59 19.39 14.62 14.46	24.81 24.61 19.38 18.94	22 21 17 17	12 15 12 10	28 29 23 20	1,375 1,155 1,054 0,9894	20.03% 16.60% 19.61% 18.73%	0,00% -1.38% 21.66% 23.04%
0 5.25 12.5 25 50		10 10 10 10 10	21.7 22 17 16.7 11.6	18.59 19.39 14.62 14.46 7.965	24.81 24.61 19.38 18.94 15.24	22 21 17 17 12.5	12 15 12 10	28 29 23 20 19	1,375 1,155 1,054 0,9894 1,607	20.03% 16.60% 19.61% 18.73% 43.81%	0,00% -1.38% 21.66% 23.04% 46.54%
) 5.25 12.5 25		10 10 10 10	21.7 22 17 16.7	18.59 19.39 14.62 14.46	24.81 24.61 19.38 18.94	22 21 17 17	12 15 12 10	28 29 23 20	1,375 1,155 1,054 0,9894	20.03% 16.60% 19.61% 18.73%	0,00% -1.38% 21.66% 23.04%
0 5.25 12.5 25 50 100 Reproduction De	D	10 10 10 10 10	21.7 22 17 16.7 11.6	18.59 19.39 14.62 14.46 7.965	24.81 24.61 19.38 18.94 15.24	22 21 17 17 12.5	12 15 12 10	28 29 23 20 19	1,375 1,155 1,054 0,9894 1,607	20.03% 16.60% 19.61% 18.73% 43.81%	0,00% -1.38% 21.66% 23.04% 46.54%
0 5.25 12.5 25 50 100 Reproduction De	D etail Code	10 10 10 10 10	21.7 22 17 16.7 11.6	18.59 19.39 14.62 14.46 7.965	24.81 24.61 19.38 18.94 15.24	22 21 17 17 12.5	12 15 12 10	28 29 23 20 19	1,375 1,155 1,054 0,9894 1,607	20.03% 16.60% 19.61% 18.73% 43.81%	0.00% -1.38% 21.66% 23.04% 46.54%
5.25 5.25 12.5 50 100 Reproduction De Conc-%	D etail	10 10 10 10 10 10	21.7 22 17 16.7 11.6 6.6	18.59 19.39 14.62 14.46 7.965 5.285	24.81 24.61 19.38 18.94 15.24 7.915	22 21 17 17 12.5 6.5	12 15 12 10 0 4	28 29 23 20 19	1.375 1.155 1.054 0.9894 1.607 0.5812	20.03% 16.60% 19.61% 18.73% 43.81% 27.85%	0.00% -1.38% 21.66% 23.04% 46.54% 69.59%
5.25 5.25 5.0 5.0 6.00 Reproduction De Conc-%	D etail Code	10 10 10 10 10 10 10	21.7 22 17 16.7 11.6 6.6	18.59 19.39 14.62 14.46 7.965 5.285	24.81 24.61 19.38 18.94 15.24 7.915	22 21 17 17 12.5 6.5	12 15 12 10 0 4 Rep 6	28 29 23 20 19 10	1,375 1,155 1,054 0,9894 1,607 0,5812	20.03% 16.60% 19.61% 18.73% 43.81% 27.85%	0.00% -1.38% 21.66% 23.04% 46.54% 69.59%
5.25 5.25 5.0 5.0 6.00 Reproduction De Conc-%	D etail Code	10 10 10 10 10 10 10	21.7 22 17 16.7 11.6 6.6	18.59 19.39 14.62 14.46 7.965 5.285 Rep 3	24.81 24.61 19.38 18.94 15.24 7.915 Rep 4	22 21 17 17 12.5 6.5 Rep 5	12 15 12 10 0 4 Rep 6	28 29 23 20 19 10 Rep 7	1,375 1,155 1,054 0,9894 1,607 0,5812 Rep 8	20.03% 16.60% 19.61% 18.73% 43.81% 27.85% Rep 9	0,00% -1.38% 21.66% 23.04% 46.54% 69.59% Rep 10
3.25 12.5 25 50 100 Reproduction De Conc-% 3.25	D etail Code	10 10 10 10 10 10 10 22 15	21.7 22 17 16.7 11.6 6.6 Rep 2 28 21	18.59 19.39 14.62 14.46 7.965 5.285 Rep 3 21	24.81 24.61 19.38 18.94 15.24 7.915 Rep 4	22 21 17 17 12.5 6.5 Rep 5 22 20	12 15 12 10 0 4 Rep 6	28 29 23 20 19 10 Rep 7 26 29	1,375 1,155 1,054 0,9894 1,607 0,5812 Rep 8	20.03% 16.60% 19.61% 18.73% 43.81% 27.85% Rep 9	0.00% -1.38% 21.66% 23.04% 46.54% 69.59% Rep 10 20 21
	D etail Code	10 10 10 10 10 10 10 Rep 1 22 15	21.7 22 17 16.7 11.6 6.6 Rep 2 28 21	18.59 19.39 14.62 14.46 7.965 5.285 Rep 3 21 25 21	24.81 24.61 19.38 18.94 15.24 7.915 Rep 4	22 21 17 17 12.5 6.5 Rep 5 22 20 16	12 15 12 10 0 4 Rep 6 24 21	28 29 23 20 19 10 Rep 7 26 29 23	1,375 1,155 1,054 0,9894 1,607 0,5812 Rep 8 12 23 17	20.03% 16.60% 19.61% 18.73% 43.81% 27.85% Rep 9 23 21 19	0.00% -1.38% 21.66% 23.04% 46.54% 69.59% Rep 10 20 21 12

000-222-335-4

CETIS™ v1.9.4.1

Analyst:_____ QA:____

Report Date: Test Code/ID:

16 Oct-19 11:38 (p 2 of 2) 19-1448 / 05-5255-8871

Ceriodaphnia 7-d Survival and Reproduction Test

New England Bioassay

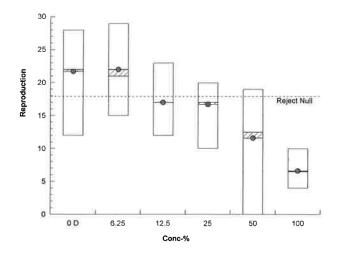
Analysis ID: 08-4538-9939 **Analyzed:** 16 Oct-19 11:38

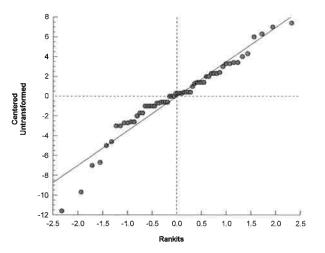
Endpoint: Reproduction
Analysis: Parametric-Control vs Treatments

CETIS Version: CETISv1,9,4

Status Level: 1

Graphics





NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADD	RESS:				reet Bouleva	rd, Lowell N		
NEB PROJECT NUMBER			5.0044476.0		TEST ORGA			iodaphnia dubia
DILUTION WATER SOU	CW	CW	ratory Soft	PD	START DAT	E: KO	10/8/19	TIME: 1355
ANALYST NEB Lab Diluent	1	2	3	4	5	6	7 7	Remarks
Temp °C Initial	25.3	25.3	24.3	24.9	24.4	24.5	24.6	
D.O. mg/L Initial	8.2	8.4	8.4	8.3	8.3	8.4	8.2	
pH s.u. Initial	7.4	7.5	7.8	7.9	8.0	7.5	8.0	
Conductivity µS Initial	183	184	194	177	183	177	194	
Temp °C Final	24.0	24.5	24.8	24.2	24.3	24.1	24.1	
D.O. mg/L Final	8.5	8.3	8.5	8.4	8.3	8.2	8.4	
pH s.u. Final	7.2	7.9	7.5	7.8	8.1	7.8	7.9	
Conductivity µS Final	196	192	189	182	189	192	205	
Merrimack River Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.4	25.3	24.5	24.4	24.4	24.8	24.6	
D.O. mg/L Initial	8.9	8.4	9.7	9.3	8.7	8.4	8.8	
pH s.u. Initial	7.1	7.5	7.6	7.7	7.9	7.5	7.9	
Conductivity µS Initial	230	233	240	240	243	242	242	
Temp °C Final	24.0	24.5	24.7	24.2	24.3	24.1	24.0	
D.O. mg/L Final	8.4	8.2	8.4	8.4	8.2	8.2	8.4	
oH s.u. Final	7.2	7.9	7.5	7.9	7.9	7.7	7.7	
Conductivity µS Final	242	241	249	256	251	252	252	
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.5	25.0	24.6	25.0	24.4	24.6	24.7	
D.O. mg/L Initial	9.0	9.0	8.5	8.5	8.5	8.4	8.3	
oH s.u. Initial	7.0	7.5	7.6	7.7	7.8	7.5	7.9	
Conductivity µS Initial	228	226	204	208	222	227	224	
Гетр °С Final	24.0	24.4	24.8	24.2	24.3	24.0	24.0	
D.O. mg/L Final	8.4	8.3	8.4	8.4	8.2	8.3	8.3	
H s.u. Final	7.2	7.8	7.6	7.7	7.8	7.7	7.6	
Conductivity µS Final	239	232	213	213	229	237	234	
12.5%	1	2	3	4	5	6	7	Remarks
emp °C Initial	25.2	25.4	24.6	25.1	24.4	24.5	24.7	
0.0. mg/L Initial	8.4	8.5	8.5	8.4	8.4	8.3	8.3	
H s.u. Initial	7.1	7.5	7.5	7.6	7.8	7.6	7.8	
Conductivity µS Initial	271	270	234	232	271	287	263	
emp °C Final	24.0	24.4	24.9	24.2	24.3	24.0	24.0	
0.0. mg/L Final	8.5	8.3	8.5	8.4	8.3	8.3	8.4	
H s.u. Final	7.2	7.8	7.7	7.7	7.9	7.6	7.6	
Conductivity µS Final	283	276	246	241	279	295	274	

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDR	ESS:	Lowell Regi			reet Bouleva			
NEB PROJECT NUMBER:			5.0044476.0		TEST ORGA			iodaphnia dubia
DILUTION WATER SOUR	CE:	Labor	atory Soft	Water	START DAT	E:	10/8/19	TIME: 1355
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.2	25.5	24.5	25.2	24.4	24.5	24.7	
D.O. mg/L Initial	8.4	8.3	8.6	8.4	8.5	8.3	8.3	
pH s.u. Initial	7.1	7.5	7.5	7.6	7.7	7.5	7.7	
Conductivity µS Initial	361	357	286	289	367	362	356	
Temp °C Final	23.8	24.3	24.7	24.2	24.3	24.0	24.0	
D.O. mg/L Final	8.4	8.3	8.4	8.4	8.3	8.3	8.3	
pH s.u. Final	7.3	7.7	7.7	7.7	7.8	7.6	7.6	
Conductivity µS Final	375	361	298	299	377	370	368	
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.2	25.5	24.7	25.3	24.3	24.4	24.8	
D.O. mg/L Initial	8.3	8.3	8.8	8.4	8.7	8.3	8.3	
pH s.u. Initial	7.1	7.4	7.4	7.5	7.5	7.5	7.6	
Conductivity µS Initial	519	526	397	403	559	554	550	
Temp °C Final	23.8	24.3	24.7	24.3	24.3	24.0	24.0	
D.O. mg/L Final	8.4	8.3	8.4	8.4	8.2	8.3	8.4	
pH s.u. Final	7.4	7.7	7.7	7.8	7.8	7.7	7.8	
Conductivity µS Final	532	529	408	411	563	559	555	
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.4	25.5	24.8	25.5	24.1	24.5	24.8	
D.O. mg/L Initial	8.5	8.3	9.4	8.8	9.1	8.4	8.3	
oH s.u. Initial	7.2	7.3	7.3	7.3	7.5	7.4	7.5	
Conductivity µS Initial	863	871	621	628	927	926	924	
Temp °C Final	24.0	24.4	24.6	24.3	24.3	24.0	24.0	
D.O. mg/L Final	8.1	8.1	8.3	8.4	8.2	8.1	8.3	
pH s.u. Final	7.6	7.8	7.8	7.8	7.9	7.9	7.8	
Conductivity µS Final	871	862	635	634	925	925	921	
somedervity go i mai								
			-					
								_

Culture Chart

Lot # <u>Cal9(RMH 223)</u>

Brood mother source: Rynd 217 34 Source's brood size: (Qty.) Lowell 108-19

Tech	Aut	AH	AH	AH	AZI	AH	AH	KF		KF		KF	Au	KC		
Date	9.26	9.27	9.28		9.30	104	10.2	10.3		10.4		10.6	10:77	10.8		
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup #	N	N	2	2	5	1	4	7	1	У		Y	У	Y		
2	N	N	2	2	5	6	4	2	2	ρ		Y	T1 717	YIS		
3	N	N	N	N	6	7	γ	2	3	Y		7	T2 Y15	Y 14		
4	N	N	2	И	5	8	ሃ	7	4	P		Y	73 7 15	Y15		
5	N	N	N	N	5	7	Y	2	5	Y		γ	T4 Y16	44		
6	N	N	2	N	le	7	y	7	6	P		Y	T5 717	Yis		
7	N	N	N	2	5	A S	1	7	7	У		Y	To Yis	T6		
8	N	N	2	2	5	1	7	2	8	À		Y	T7 Y 15	To		
9	N	N	2	13	6	12	7	7	9	Y		Y	тъ У 15	T8		
10	N	N	2	N	3	7	Y	2	10	7		Y	У	Ta		
11	N	N	7	N	4	8	7	\sim	11	Ч		γ) 7 15	Tio		
12	N	N	2	N	4	8	У	\sim	12	Y		Y	Y18	Y		
13	N	N	2	N	(0	9	7	N	13	7		У	(To	Y		

Y = neonates present, and criterion has been met: ≥ 20 neonates produced in total by 3rd brood.

N = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood.

X = brood mother dead ae = aborted eggs

✓ or P = neonates present after renewal on previous day (see time in log).

= acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted).

acc. = if acclimated, H2O type used w/ renewal this day.

Test organism collection:

Tray diagram used?

Project #	Symbols (✓ / P)	(Y/N)	Time period, neonates released	Collection date / time
0044654	Т	Y	10.6.19/1630 -> 10.66.19/1825	10.719/1225
0044158	①	7	10.6.19/1630 -> 10.46.19/1825	10.7.19/1250
0044476	Т	Y	10-7-19/1630 -> 10-7-19/1945	10.8.19/ 1300
	Т			7
	Т			
	Т			

Tab	le o	f Ra	ndo	m P	ermuta	tion	s of	16				C.d	ubia	Test	ID#		19-1	448	}
7	12	15	15	1	2	7	16	10	2	14		7	13	13	10	6	1	8	10
13 3	3 1	8 4	16 5	7 14	10 13	11 3	10 14	13 9	5 13	11 13		13 9	16 15	7 6	7 2	5 8	13 4	2 5	14 8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4 6	6 14	13 6	7 10	2 4	15 14	1 4	9 15	1 3	4 3	7 4	10 16	6 2	9 6	11 5	9 1	7 12	6 10	16 6	11 9
10	15	2	1	13	12	16	3	4	8	10		15	5	14	12	14	12	3	2
12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8 1E	12 5	6	15	6	13	16	12	15	4 14	11	8 5	12 13	6
16 9	2 13	11 14	8	8 6	8 4	15 10	5 11	16 5	1 12	1 9	9	8 10	1 4	8 4	3	16 10	9	13	5 3
8	11	9	4	11	3	12	7	7	10	12		3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16
11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
6 14	13 12	2 4	13 16	6 16	5 11	9 14	15 10	11 5	10 12	12 3	6 3	16 12	15 14	16 15	9 13	10 6	12 4	16 1	15 16
8	6	3	9	4	10	6	4	16	2	2	9	8	16	4	6	5	15	7	8
9	15	12	10	3	2	12	6	1	15	4	13	7	7	9	12	14	8	8	11
3 16	10 1	11 13	12 14	13 8	12 14	5 15	11 5	7 3	8 7	9 11	5 15	14 6	11 12	10 5	1 7	3 11	13 1	3 14	5 4
1	14	14	2	9	15	16	14	6	14	7	8	3	13	11	8	7	7	12	7
4	4	6	4	12	3	11	8	15	9	8	1	13	6	3	3	15	9	9	12
15	5	1	11	10	6	3	7	10	5	5	11	10	10	12	15	16	14	5	2
5 12	3 7	5 15	6 15	7 15	7 9	13 8	2 12	14 12	3 13	16 15	4 10	5 1	5 4	13 6	4 16	9 2	16 6	2 11	6 1
10	11	10	3	2	4	2	1	4	6	6	7	11	9	14	10	8	11	4	13
7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10
1	6	7	4	8	6	5	2	8	15	4	6	6	1	4	5	7	13	2	10
9 10	15 16	11 4	3 5	11 12	15 9	9 16	10 11	1 7	3 1	8 7	2 16	15 11	7 8	9 3	8 3	16 12	1 2	14 3	3 4
4	14	1	9	5	5	4	13	6	8	15	5	12	5	7	16	5	11	8	1
7	3	13	14	15	2	1	14	16	5	14	9	2	16	1	12	6	14	4	13
16	11	2	1	14	16	6	9	3	4	16	14	3	15	11	11	3	9	12	5
3 11	10 13	16 9	16 13	13 4	7 13	13 8	1 3	11 5	14 13	9 10	10 12	16 5	2 12	10 5	2 14	10 13	7 16	10 5	16 6
15	2	3	12	9	12	2	4	13	10	3	13	14	4	2	1	14	8	6	12
14	1	14	6	10	1	3	12	4	2	2	4	13	3	16	9	9	3	7	14
13	12	5	11	3	11	15	8	2	7	11	7	8	14	6	4	4	4	15	11
12 8	5 9	10 8	7 10	2 6	14 4	7 11	15 7	14 10	16 11	13 6	1 8	9 4	10 9	12 8	10 15	11 8	10 6	9 11	8 9
2	7	6	2	1	8	10	6	15	12	1	11	7	11	13	6	1	15	13	15
6	4	15	8	16	10	14	16	9	6	12	3	10	6	14	7	2	12	16	7
5	8	12	15	7	3	12	5	12	9	5	15	1	13 conc	15	13	15	5	1	2 rep
13	4	10	4	16	13	16	13	5	3	6	14	1	16	8	7	2	3	3	12
5 2	14 2	4 2	6 15	8 14	2 16	15 9	1 12	13 16	14 6	16 10	4 15	15 14	9	3 10	12 1	12 14	1 8	4 8	16
7	12	15	8	12	3	5	14	7	12	5	13	16		7	5	11	2	9	3
6	9	7	14	9	14	10	11	15	11	12	1	12	12	14	16	3	11	11	8
14	5	16	7	10	8	11	8	14	13	7	11	6	3	11	4	4	6	6	9
15 11	11 6	8 6	9 1	7 4	12 1	8 3	7 16	1 12	15 5	9 4	3 9	3 13	13	13 6	11 8	10 15	4 9	5 1	14
4	10	3	16	2	11	7	9	6	9	1	8	4	11	5	2	16	10	12	4
1	8	1	13	1	15	4	4	11	4	2	16	5	8	1	9	5	12	16	6
9 12	7 1	14 9	2 10	6 15	4 5	14 2	10 15	9 10	8	15 14	10	7 8	10	9	10 13	6 8	14 5	10 15	5
3	3	12	11	5	9	6	6	3	2 10	13	2 12	9	6	2	15	7	5 15	7	13
10	15	11	5	13	7	12	5	2	7	11	5	10	15	12	3	1	13	13	10
8	13	13	3	3	10	13	2	4	1	8	6	11	14	15	6	9	16	2	2
16	16	5	12	11	6	1	3	8	16	3	7	2	5	16	14	13	7	14	15

SAMPLE RECEIPT CHEMISTRY & CHAIN OF CUSTODY DOCUMENTS

NEW ENGLAND BIOASSAY - INITIAL CHEMISTRY DATA

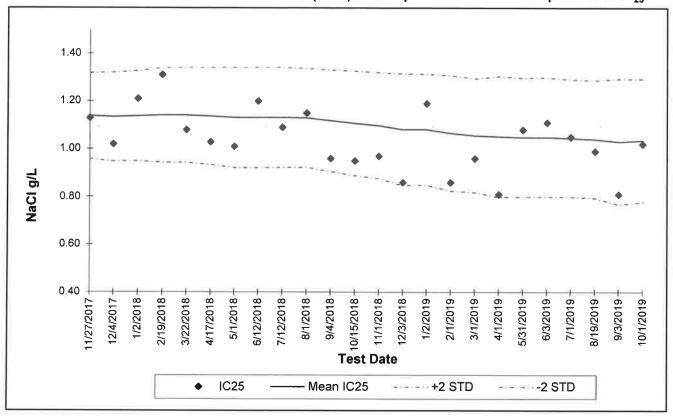
PERMITTEE:_	Lowell RWWU
NEB JOB #	05.0044476.00

DATE RECEIVED	10/7/19		10/9/19		10/11/19	
SAMPLE TYPE:	EFF #1	RIVER #1	EFF #2	RIVER #2	EFF #3	RIVER #3
COC#	C39-3714	C39-3715	C39-3754	C39-3755	C39-3801	C39-3802
pH (SU)	6.9	6.9	7.3	7.3	6.9	6.8
Temperature (°C)	2.0	2.4	1.8	2.0	3.2	2.0
Dissolved Oxygen (mg/L)	10.3	10.7	12.5	12.4	11.0	10.3
Conductivity (µmhos)	886	233	638	240	937	245
Salinity (ppt)	<1	<1	<1	<1	< 1	< 1
TRC - DPD (mg/L)	0.074	0.035	0.009	0.035	0.015	0.019
TRC - Amperometric (mg/L)	<0.05	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as CaCO ₃)	76	28	60	32	74	32
Alkalinity (mg/l as CaCO ₃)	95	20	55	15	90	20
Tech Initials	СН	СН	ко	ко	CW	CW

NOTE: NA = NOT API	PLICABLE		
Data Reviewed By:	m:115	Date Reviewed:	1/14/19

REFERENCE TOXICANT CHARTS

New England Bioassay
Reference Toxicant Data: Sodium chloride (NaCl) Ceriodaphia dubia Chronic Reproduction IC₂₅



								Repro PMSD	Avg. PMSD
Test ID	Date	IC ₂₅	Mean IC ₂₅	STD	-2STD	+2STD	Avg. CV	(%)	(%)
17-1787	11/27/2017	1.13	1.14	0.09	0.96	1.32	0.08	19.97	16.69
17-1846	12/4/2017	1.02	1.13	0.09	0.95	1.32	0.08	14.69	16.60
18-10	1/2/2018	1.21	1,14	0.09	0.95	1,33	0.08	10.81	16.36
18-271	2/19/2018	1.31	1.14	0.10	0.94	1.34	0.09	22.90	16.56
18-416	3/22/2018	1.08	1.14	0.10	0.94	1.34	0.09	17.59	16.88
18-553	4/17/2018	1.03	1,14	0.10	0.93	1.34	0.09	38.54	17.77
18-607	5/1/2018	1.01	1.13	0.10	0.92	1.34	0.09	24.65	18.25
18-816	6/12/2018	1.20	1.13	0.11	0.92	1.34	0.09	46.97	19.59
18-996	7/12/2018	1.09	1,13	0.10	0.92	1.34	0.09	11,41	19.70
18-1103	8/1/2018	1.15	1.13	0.10	0.92	1.34	0.09	17.23	19.67
18-1315	9/4/2018	0.96	1.12	0.11	0.91	1.33	0.10	22.12	20.09
18-1577	10/15/2018	0.95	1,11	0.11	0.89	1,33	0.10	24.32	20.64
18-1625	11/1/2018	0.97	1,10	0.11	0.88	1.32	0.10	31,57	21.34
18-1756	12/3/2018	0.86	1.08	0.12	0.85	1.32	0.11	15.77	21.00
19-8	1/2/2019	1.19	1.08	0.12	0.85	1.31	0.11	40.72	21.30
19-177	2/1/2019	0.86	1.07	0.12	0.82	1.31	0.11	18.71	21.63
19-265	3/1/2019	0.96	1,06	0.12	0.82	1,29	0.11	19.84	22.13
19-403	4/1/2019	0.81	1.05	0.13	0.80	1.30	0.12	10.09	21.85
19-674	5/31/2019	1.08	1.05	0.12	0.80	1.30	0:12	15.59	21.93
19-688	6/3/2019	1.11	1.05	0.12	0.80	1.30	0.12	15.24	22.23
19-926	7/1/2019	1.05	1.04	0.12	0.80	1.29	0.12	12.60	22,23
19-1154	8/19/2019	0.99	1.04	0.12	0.79	1.29	0.12	24.17	22.24
19-1226	9/3/2019	0.81	1.03	0.13	0.77	1.29	0.13	19.49	21.64
19-1396	10/1/2019	1.02	1.04	0.13	0.78	1.29	0.12	18.01	21.38

National 75th Percentile and 90th Percentile CV Averages for Ceriodaphnia Reproduction IC25 (EPA 833-R-00-003): 0.45 - 0.62 PMSD Upper and Lower Bounds for Ceriodaphnia Reproduction (EPA-821-R-02-013): 13% - 47%

Work Order: 9J07023 Date: 11/5/2019 3:39:13PM

Results:

Sample: Effluent

9J07023-01 (Water)

General Chemistry

	Result	Reporting	Units	Date
		Limit		Analyzed
Alkalinity as CaCO3	14	2	mg/L	10/08/19
Ammonia	17.1	1.0	mg/L	10/11/19
pH	7.2	0.1	SU	10/07/19 17:20
Specific Conductance	815	2	uS/cm	10/08/19
Total Dissolved Solids	376	10	mg/L	10/09/19
Total Organic Carbon	8.9	0.2	mg/L	10/09/19
Total solids (TS)	412	10	mg/L	10/09/19
Total Suspended Solids	6	2	mg/L	10/09/19

Total Metals

	Result	Reporting	Units	Date
		Limit		Analyzed
Calcium	21.1	0.05	mg/L	10/09/19
Magnesium	4.20	0.05	mg/L	10/09/19
Aluminum	0.030	0.001	mg/l	10/08/19
Cadmium	ND	0.0001	mg/L	10/08/19
Copper	0.007	0.001	mg/l	10/08/19
Nickel	0.003	0.001	mg/l	10/08/19
Lead	0.0005	0.0001	mg/L	10/08/19
Zinc	0.060	0.001	mg/l	10/08/19
Total Hardness	70.1	0.125	mg/L	10/09/19

Sample: Receiving Water

9J07023-02 (Water)

General Chemistry

-				
	Result	Reporting Limit	Units	Date Analyzed
Alkalinity as CaCO3	14	2	mg/L	10/09/19
Ammonia	0.3	0.1	mg/L	10/11/19
pH	7.0	0.1	SU	10/07/19 17:20
Specific Conductance	211	2	uS/cm	10/08/19
Total Dissolved Solids	68	10	mg/L	10/09/19
Total Organic Carbon	2.8	0.2	mg/L	10/09/19
Total solids (TS)	92	10	mg/L	10/09/19
Total Suspended Solids	ND	2	mg/L	10/09/19

Work Order: 9J07023 Date: 11/5/2019 3:39:13PM

Sample: Receiving Water (Continued)

9J07023-02 (Water)

Total Metals

	Result	Reporting Limit	Units	Date Analyzed
Calcium	8.21	0.05	mg/L	10/09/19
Magnesium	1.57	0.05	mg/L	10/09/19
Aluminum	0.025	0.001	mg/l	10/08/19
Cadmium	ND	0.0001	mg/L	10/08/19
Copper	0.001	0.001	mg/l	10/08/19
Nickel	ND	0.001	mg/l	10/08/19
Lead	0.0002	0.0001	mg/L	10/08/19
Zinc	0.006	0.001	mg/l	10/08/19
Total Hardness	27.0	0.125	mg/L	10/09/19

NEW ENGLAND BIO	OASSAY CHAIN-OF-CUSTODY
EFFLUENT	RECEIVING WATER Sample Set # 1
Sampler: JIN ROK MCJOWAN	Sampler: Advon Fux
Title: 6429157	Title: Ops. Superint
Facility: Lowell Regional Wastewater Utilities	Facility: Lowell Regional Wastewater Utilities
Sampling Method: X Composite	Sampling Method: X Grab
Sample ID:	Sample ID: Merrimack River
Start Date: 10-6-19 Time: 7==0	Date Collected: 10-7-19
Start Date: 10-6-9 Time: 7==2 End Date: 10-7-14 Time: 7==0	Time Collected: $P = 30 A J$
Sampling Method: Grab (for pH and TRC only_)
Date Collected:	
Time Collected:	
Sample Type: Prechlorinated	Received
X Dechlorinated Unchlorinated	ON ICE
Chlorinated	The second secon
(Rt.38)	rrimack River upstream of the plant discharge at the Hunts Fall Bridge,
Requested Analysis: X Chronic and modified acute	
Sa Sa	mple Shipment
Method of Shipment: New England Testing Labs	
Relinquished By:	Date: 10-7-11 Time: 11:15 AM
Received By:	Date: 10/7/19 Time: 11:15
Relinquished By:	Date: 10/7/19 Time: 16/5
Received By:	Date: 10/7/19 Time: 4.65
Relinquished By:	Date: 10/7/19 Time: 4:55
Received By: fall feul	Date: 10/8/19 Time: 08QO
FOR	NEB USE ONLY
* Please return all ice packs NEB has provided to ins	sure accurate temperature upon receipt to the NEB laboratory *
Temperature of Effluent Upon Receipt at Lab: OC	Temperature of Receiving Water Upon Receipt at Lab: 2.4 °C
Effluent COC# <u>(39-3714</u>	Receiving Water COC#

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO: KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

NEW ENGLAND BIOASSA	Y CHAIN-OF-CUSTODY
EFFLUENT	RECEIVING WATER Sample Set #2
Sampler: J. N-BOK M GOIVAN	Sampler: Acron Fox
Title: CHEMIST	Title: Ops, superint
Facility: Lowell Regional Wastewater Utilities	Facility: Lowell Regional Wastewater Utilities
Sampling Method: X Composite	Sampling Method: X Grab
	Sample ID: Merrimack River
Sample ID:	Date Collected: 12 9 1 1
Start Date: 10-8-11 Time: 7:55	
End Date: 10-8-11 Time: 7:0)	Time Collected: 3-3 Arg
Sampling Method: Grab (for pH and TRC only)	
Date Collected:	
Time Collected:	
Sample Type: Prechlorinated	
X Dechlorinated	
Unchlorinated Chlorinated	
Cinormated	
Effluent Sampling Location and Procedures: Plant outfall after d	echlorination. 24 hr. composite.
D.	
Receiving Water Sampling Location and Procedures: Merrimack	River upstream of the plant discharge at the Hunts Fall Bridge,
(Rt.38)	
Provided to the state of the st	Received
Requested Analysis: X Chronic and modified acute	ON ICE
Sample S	
Method of Shipment: New England Testing Labs	
1	10-8-18 10=40
Relinquished By: Date:	Time:
Received By: Date:	10/10
Relinquished By: Date:	Time: 500
Received By: Date: /	-1/100
D.II. 11 1D 00 0	0/19/19 Time: 1:00
Relinquished By: Date:	2:34
Received By: Date: Date:	2:34
Received By: Date:	0/19/19 Time: 2:00 0/9/19 Time: 1420
Received By: Date:	Time: 2:00 Time: 1420 SE ONLY
Received By: Please return all ice packs NEB has provided to insure ac	SE ONLY curate temperature upon receipt to the NEB laboratory *
Received By: Please return all ice packs NEB has provided to insure ac	Time: 2:00 Time: 1420 SE ONLY

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO: KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042

NEW ENGLAND B	BIOASSAY CHAIN-OF-CUSTODY
EFFLUENT	RECEIVING WATER Sample Set #3
Sampler: 51/V 137K MCGA	Sampler: Aug For
Title: (1/6/19/15)	Title: Ops. superointen
Facility: Lowell Regional Wastewater Utilities	Facility: Lowell Regional Wastewater Utilities
Sampling Method: X Composite	Sampling Method: X Grab
Sample ID:	Sample ID: Merrimack River
Start Date: 10-13-19 Time:	Date Collected: 19-11-19
Start Date: 10-10-19 Time: 7-03 End Date: 10-11-19 Time: 7-03	Date Collected: 19-11-19 Time Collected: 7-88 Ag
Sampling Method: Grab (for pH and TRC only	·)
Date Collected:	
Time Collected:	Received
Comple Towns	ONICE
Sample Type: X Dechlorinated Unchlorinated Chlorinated	
(Rt.38)	Terrimack River upstream of the plant discharge at the Hunts Fall Bridge,
Requested Analysis: X Chronic and modified acute	
S	ample Shipment
Method of Shipment: New England Testing Labs	
Relinquished By: fin ping	Date: 10-11-19 Time: 120
Received By:	Date: 10/11/19 Time: 1020
Relinquished By:	Date: 10/11/19 Time: 1230
Received By:	Date: 10/11/19 Time: 12:30
Relinquished By:	Date: 10/11/19 Time: 1:20
Received By:	Date: 10/11/19 Time: /320
FOR	NEB USE ONLY
* Please return all ice packs NEB has provided to in	isure accurate temperature upon receipt to the NEB laboratory *
Temperature of Effluent Upon Receipt at Lab: 3.2 °C	Temperature of Receiving Water Upon Receipt at Lab:
Effluent COC#	Receiving Water COC# <u>139-3802</u>

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO: KIM WILLS, NEW ENGLAND BIOASSAY, 77 BATSON DRIVE, MANCHESTER CT 06042